Release notes for ENDF/B Development n-040_Zr_092 evaluation

April 26, 2017

- `psyche` Warnings:

1. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 92. L = 1 / AT RESONANCE ENERGY 9.82100E+03 EV. THE GAMMA WIDTH 8.50000E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.17988E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS =  92. L =  1
                AT RESONANCE ENERGY  9.82100E+03 EV. THE GAMMA WIDTH  8.50000E-02 DEVIATES TOO MUCH FROM THE AV
```

2. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 92. L = 1 / AT RESONANCE ENERGY 3.89220E+04 EV. THE GAMMA WIDTH 1.00000E-01 DEVIATES TOO MUCH FROM THE AVERAGE 3.17988E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS =  92. L =  1
                AT RESONANCE ENERGY  3.89220E+04 EV. THE GAMMA WIDTH  1.00000E-01 DEVIATES TOO MUCH FROM THE AV
```

3. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 92. L = 1 / AT RESONANCE ENERGY 1.06050E+05 EV. THE GAMMA WIDTH 1.32000E+00 DEVIATES TOO MUCH FROM THE AVERAGE 3.17988E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS =  92. L =  1
                AT RESONANCE ENERGY  1.06050E+05 EV. THE GAMMA WIDTH  1.32000E+00 DEVIATES TOO MUCH FROM THE AV
```

4. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 92. L = 1 / AT RESONANCE ENERGY 1.11400E+05 EV. THE GAMMA WIDTH 6.40000E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.17988E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS =  92. L =  1
                AT RESONANCE ENERGY  1.11400E+05 EV. THE GAMMA WIDTH  6.40000E-02 DEVIATES TOO MUCH FROM THE AV
```

5. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 92. L = 1 / AT RESONANCE ENERGY 1.20000E+05 EV. THE GAMMA WIDTH 1.46000E+00 DEVIATES TOO MUCH FROM THE AVERAGE 3.17988E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS =  92. L =  1
                AT RESONANCE ENERGY  1.20000E+05 EV. THE GAMMA WIDTH  1.46000E+00 DEVIATES TOO MUCH FROM THE AV
```

6. Level density in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 1.21000E+05. STRENGTH FUNCTION IS 5.11000E-04 / ENERGY = 1.21000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 2.25176E+03 SHOULD BE 1.99773E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.21000E+05. STRENGTH FUNCTION IS  5.11000E-04
                   ENERGY =  1.21000E+05. STRENGTH FUNCTION IS  5.11000E-04
                                     DENSITY  2.25176E+03 SHOULD BE  1.99773E+03
```

7. Level density in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 2.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 2.05377E+03 SHOULD BE 1.82209E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                              DENSITY  2.05377E+03 SHOULD BE  1.82209E+03
```

8. Level density in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 3.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 1.82928E+03 SHOULD BE 1.62292E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                              DENSITY  1.82928E+03 SHOULD BE  1.62292E+03
```

9. Level density in URR not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ENERGY = 4.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 1.63065E+03 SHOULD BE 1.44670E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  4.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                              DENSITY  1.63065E+03 SHOULD BE  1.44670E+03
```

10. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 5.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 1.45474E+03 SHOULD BE 1.29063E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  5.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                              DENSITY  1.45474E+03 SHOULD BE  1.29063E+03
```

11. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 6.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 1.29882E+03 SHOULD BE 1.15230E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  6.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                              DENSITY  1.29882E+03 SHOULD BE  1.15230E+03
```

12. Level density in URR not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ENERGY = 7.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 1.16048E+03 SHOULD BE 1.02957E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  7.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                         DENSITY  1.16048E+03 SHOULD BE  1.02957E+03
```

13. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 8.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 1.03766E+03 SHOULD BE 9.20597E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  8.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                         DENSITY  1.03766E+03 SHOULD BE  9.20597E+02
```

14. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 9.00000E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 9.28506E+02 SHOULD BE 8.23760E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  9.00000E+05. STRENGTH FUNCTION IS  5.11000E-04
                         DENSITY  9.28506E+02 SHOULD BE  8.23760E+02
```

15. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 9.44726E+05. STRENGTH FUNCTION IS 5.11000E-04 / DENSITY 8.83683E+02 SHOULD BE 7.83994E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  9.44726E+05. STRENGTH FUNCTION IS  5.11000E-04
                         DENSITY  8.83683E+02 SHOULD BE  7.83994E+02
```

16. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 1.21000E+05. STRENGTH FUNCTION IS 5.00000E-05 / ENERGY = 1.21000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 1.83261E+03 SHOULD BE 1.50117E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
         ENERGY =  1.21000E+05. STRENGTH FUNCTION IS  5.00000E-05
                  ENERGY =  1.21000E+05. STRENGTH FUNCTION IS  5.00000E-05
                               DENSITY  1.83261E+03 SHOULD BE  1.50117E+03
```

17. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 2.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 1.67148E+03 SHOULD BE 1.36918E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  2.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  1.67148E+03 SHOULD BE  1.36918E+03
```

18. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 3.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 1.48878E+03 SHOULD BE 1.21952E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  3.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  1.48878E+03 SHOULD BE  1.21952E+03
```

19. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 4.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 1.32712E+03 SHOULD BE 1.08710E+03 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  4.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  1.32712E+03 SHOULD BE  1.08710E+03
```

20. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 5.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 1.18395E+03 SHOULD BE 9.69827E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  5.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  1.18395E+03 SHOULD BE  9.69827E+02
```

21. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 6.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 1.05705E+03 SHOULD BE 8.65877E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  6.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  1.05705E+03 SHOULD BE  8.65877E+02
```

22. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 7.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 9.44469E+02 SHOULD BE 7.73655E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  7.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  9.44469E+02 SHOULD BE  7.73655E+02
```

23. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 8.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 8.44505E+02 SHOULD BE 6.91771E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  8.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  8.44505E+02 SHOULD BE  6.91771E+02
```

24. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 9.00000E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 7.55672E+02 SHOULD BE 6.19004E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  9.00000E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  7.55672E+02 SHOULD BE  6.19004E+02
```

25. Level density in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 9.44726E+05. STRENGTH FUNCTION IS 5.00000E-05 / DENSITY 7.19193E+02 SHOULD BE 5.89122E+02 (0): URR dens. (a)

```
FILE  2
   SECTION 151
            ENERGY =  9.44726E+05. STRENGTH FUNCTION IS  5.00000E-05
                         DENSITY  7.19193E+02 SHOULD BE  5.89122E+02
```

- `groupie` Errors:

1. Very small elastic cross section found
0: Small elastic

```
 Multi-Group and Multi-Band Parameters from ENDF/B Data (GROUPIE 2015-2)
 ------------------------------------------------------------------------------
 ENDF/B Input and Output Data Filenames
 ENDFB.IN
 ENDFB.OUT
... [97 more lines]
```

- `fudge-4.0` Warnings:

1. Missing a channel with a particular angular momenta combination
resonances / resolved / MultiLevel_BreitWigner (Error # 0): missingResonanceChannel

```
WARNING: Missing a channel with angular momenta combination L = 0, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 0.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 2.5 and S = 1.5 for "capture"
```

2. Potential scattering hasn't converted, you need more L's!
resonances / resolved (Error # 1): potentialScatteringNotConverged

```
WARNING: Potential scattering hasn't converged by L=1 at E=121000.0 eV, xs[1]/xs[0]=0.457820999748% > 0.1%
```

3. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 1.39%
```

4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 1 (n + Zr92): / Form 'eval': / Component 1 (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 2 ((z,n)): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (n[multiplicity:'2'] + Zr91 + gamma): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

7. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 4 (Zr93 + gamma): / Form 'eval': / Component 1 (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

- `fudge-4.0` Errors:

1. Calculated and tabulated Q values disagree.
reaction label 11: n[multiplicity:'2'] + Zr91 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -8665272.398513794 eV vs -8.635e6 eV!
```

2. Calculated and tabulated Q values disagree.
reaction label 12: n[multiplicity:'3'] + Zr90 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -15859726.97537231 eV vs -1.5829e7 eV!
```

3. Calculated and tabulated Q values disagree.
reaction label 13: n + H1 + Y91 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -9427847.080413818 eV vs -7.174e6 eV!
```

4. Calculated and tabulated Q values disagree.
reaction label 14: n + H2 + Y90 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -15136541.40991211 eV vs -8.846e6 eV!
```

5. Calculated and tabulated Q values disagree.
reaction label 15: H1 + Y92 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2888233.750106812 eV vs -2.858e6 eV!
```

6. Calculated and tabulated Q values disagree.
reaction label 16: H1 + (Y92_c ->Y92 + gamma) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2888233.750106812 eV vs -2.858e6 eV!
```

7. Calculated and tabulated Q values disagree.
reaction label 17: He4 + Sr89 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 3372422.236831665 eV vs 3.398e6 eV!
```

8. Calculated and tabulated Q values disagree.
reaction label 18: He4 + Sr89_e1 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 2340422.236831665 eV vs 2.366e6 eV!
```

9. Calculated and tabulated Q values disagree.
reaction label 19: He4 + Sr89_e2 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1899072.236831665 eV vs 1924650. eV!
```

10. Calculated and tabulated Q values disagree.
reaction label 20: He4 + Sr89_e3 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1432232.236831665 eV vs 1457810. eV!
```

11. Calculated and tabulated Q values disagree.
reaction label 21: He4 + Sr89_e4 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1364832.236831665 eV vs 1390410. eV!
```

12. Calculated and tabulated Q values disagree.
reaction label 22: He4 + Sr89_e5 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1315022.236831665 eV vs 1.3406e6 eV!
```

13. Calculated and tabulated Q values disagree.
reaction label 23: He4 + Sr89_e6 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1310922.236831665 eV vs 1.3365e6 eV!
```

14. Calculated and tabulated Q values disagree.
reaction label 24: He4 + Sr89_e7 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1293422.236831665 eV vs 1.319e6 eV!
```

15. Calculated and tabulated Q values disagree.
reaction label 25: He4 + Sr89_e8 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1092232.236831665 eV vs 1117810. eV!
```

16. Calculated and tabulated Q values disagree.
reaction label 26: He4 + Sr89_e9 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 920782.236831665 eV vs 946360. eV!
```

17. Calculated and tabulated Q values disagree.
reaction label 27: He4 + Sr89_e10 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 802322.236831665 eV vs 8.279e5 eV!
```

18. Calculated and tabulated Q values disagree.
reaction label 28: He4 + Sr89_e11 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 697422.236831665 eV vs 7.23e5 eV!
```

19. Calculated and tabulated Q values disagree.
reaction label 29: He4 + Sr89_e12 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 665302.236831665 eV vs 690880. eV!
```

20. Calculated and tabulated Q values disagree.
reaction label 30: He4 + Sr89_e13 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 567422.236831665 eV vs 5.93e5 eV!
```

21. Calculated and tabulated Q values disagree.
reaction label 31: He4 + Sr89_e14 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 456422.236831665 eV vs 4.82e5 eV!
```

22. Calculated and tabulated Q values disagree.
reaction label 32: He4 + Sr89_e15 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 441922.236831665 eV vs 4.675e5 eV!
```

23. Calculated and tabulated Q values disagree.
reaction label 33: He4 + Sr89_e16 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 410522.236831665 eV vs 4.361e5 eV!
```

24. Calculated and tabulated Q values disagree.
reaction label 34: He4 + Sr89_e17 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 299422.236831665 eV vs 3.25e5 eV!
```

25. Calculated and tabulated Q values disagree.
reaction label 35: He4 + Sr89_e18 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 244422.236831665 eV vs 2.7e5 eV!
```

26. Calculated and tabulated Q values disagree.
reaction label 36: He4 + Sr89_e19 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 172422.236831665 eV vs 1.98e5 eV!
```

27. Calculated and tabulated Q values disagree.
reaction label 37: He4 + Sr89_e20 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 144552.236831665 eV vs 170130. eV!
```

28. Calculated and tabulated Q values disagree.
reaction label 38: He4 + Sr89_e21 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 123422.236831665 eV vs 1.49e5 eV!
```

29. Calculated and tabulated Q values disagree.
reaction label 39: He4 + Sr89_e22 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 69322.23683166504 eV vs 9.49e4 eV!
```

30. Calculated and tabulated Q values disagree.
reaction label 40: He4 + Sr89_e23 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -15677.76316833496 eV vs 9.9e3 eV!
```

31. Calculated and tabulated Q values disagree.
reaction label 41: He4 + Sr89_e24 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -17577.76316833496 eV vs 8.e3 eV!
```

32. Calculated and tabulated Q values disagree.
reaction label 42: He4 + Sr89_e25 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -31677.76316833496 eV vs -6.1e3 eV!
```

33. Calculated and tabulated Q values disagree.
reaction label 43: He4 + Sr89_e26 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -48577.76316833496 eV vs -2.3e4 eV!
```

34. Calculated and tabulated Q values disagree.
reaction label 44: He4 + Sr89_e27 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -60637.76316833496 eV vs -35060. eV!
```

35. Calculated and tabulated Q values disagree.
reaction label 45: He4 + Sr89_e28 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -95577.76316833496 eV vs -7.e4 eV!
```

36. Calculated and tabulated Q values disagree.
reaction label 46: He4 + Sr89_e29 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -136217.763168335 eV vs -110640. eV!
```

37. Calculated and tabulated Q values disagree.
reaction label 47: He4 + Sr89_e30 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -151877.763168335 eV vs -1.263e5 eV!
```

38. Calculated and tabulated Q values disagree.
reaction label 48: He4 + Sr89_e31 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -168577.763168335 eV vs -1.43e5 eV!
```

39. Calculated and tabulated Q values disagree.
reaction label 49: He4 + Sr89_e32 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -226577.763168335 eV vs -2.01e5 eV!
```

40. Calculated and tabulated Q values disagree.
reaction label 50: He4 + Sr89_e33 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -261577.763168335 eV vs -2.36e5 eV!
```

41. Calculated and tabulated Q values disagree.
reaction label 51: He4 + Sr89_e34 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -279287.763168335 eV vs -253710. eV!
```

42. Calculated and tabulated Q values disagree.
reaction label 52: He4 + Sr89_e35 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -299677.763168335 eV vs -2.741e5 eV!
```

43. Calculated and tabulated Q values disagree.
reaction label 53: He4 + Sr89_e36 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -304577.763168335 eV vs -2.79e5 eV!
```

44. Calculated and tabulated Q values disagree.
reaction label 54: He4 + Sr89_e37 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -327397.763168335 eV vs -301820. eV!
```

45. Calculated and tabulated Q values disagree.
reaction label 55: He4 + Sr89_e38 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -355577.763168335 eV vs -3.3e5 eV!
```

46. Calculated and tabulated Q values disagree.
reaction label 56: He4 + Sr89_e39 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -372577.763168335 eV vs -3.47e5 eV!
```

47. Calculated and tabulated Q values disagree.
reaction label 57: He4 + (Sr89_c ->Sr89 + gamma) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -372577.763168335 eV vs -3.47e5 eV!
```

48. Calculated and tabulated Q values disagree.
reaction label 58: Zr93 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 6703999.774307251 eV vs 6.733e6 eV!
```

49. Calculated and tabulated Q values disagree.
reaction label 59: n + He4 + Sr88 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -2986295.88104248 eV vs -2.96e6 eV!
```

50. Calculated and tabulated Q values disagree.
reaction label 60: n[multiplicity:'2'] + He4 + Sr87 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -14098941.37391663 eV vs -1.4073e7 eV!
```

51. Calculated and tabulated Q values disagree.
reaction label 61: H1 + He4 + Rb88 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -7516242.346313477 eV vs -7.492e6 eV!
```

52. Calculated and tabulated Q values disagree.
reaction label 62: H2 + (Y91_s ->Y91 + gamma) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -7207654.077728271 eV vs -7.174e6 eV!
```

53. Calculated and tabulated Q values disagree.
reaction label 63: H3 + (Y90_s -> Y90 + gamma) (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -8879035.645095825 eV vs -8.846e6 eV!
```

- `njoy2012` Warnings:

1. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (0): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 16 does not give recoil za= 40091
                          one-particle recoil approx. used.
```

2. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (1): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 17 does not give recoil za= 40090
                          one-particle recoil approx. used.
```

3. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (2): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 22 does not give recoil za= 38088
                          one-particle recoil approx. used.
```

4. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (3): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 24 does not give recoil za= 38087
                          one-particle recoil approx. used.
```

5. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (4): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 28 does not give recoil za= 39091
                          one-particle recoil approx. used.
```

6. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (5): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 32 does not give recoil za= 39090
                          one-particle recoil approx. used.
```

7. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (6): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 91 does not give recoil za= 40092
                          one-particle recoil approx. used.
```

8. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (7): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt102 does not give recoil za= 40093
                          photon momentum recoil used.
```

9. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (8): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt104 does not give recoil za= 39091
                          one-particle recoil approx. used.
```

10. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (9): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt105 does not give recoil za= 39090
                          one-particle recoil approx. used.
```

11. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (10): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt112 does not give recoil za= 37088
                          one-particle recoil approx. used.
```

12. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (11): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt649 does not give recoil za= 39092
                          one-particle recoil approx. used.
```

13. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (12): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt849 does not give recoil za= 38089
                          one-particle recoil approx. used.
```